

ATTACHMENT A
Variance Report
Fernald Closure Project

**ATTACHMENT A
VARIANCE REPORT
FERNALD CLOSURE PROJECT**

This report presents the differences between the current agreements end state and the risk-based end state (RBES) Vision for the Fernald Closure Project (FCP). The intent of this report is to communicate the individual Variances and provide management with enough data to evaluate the impact of the variances on current plans.

Table 1 provides a description of each proposed Variance along with the impacts of the Variance, barriers to implementation, and any recommendations that may be helpful in the evaluation of the variance. Two maps are provided to illustrate the variances: Figure 1 depicts the end state based on current agreements and Figure 2 depicts the end state based on RBES.

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Table 1. Summary of FCP site variances.

ID No.	Description of Variance	Impacts (In Terms of Scope, Cost, Schedule, and Risk)	Barriers to Achieving RBES	Recommendations
V-1	<p>On-Site Disposal Facility:</p> <p>a) The OSDF was designed for a specific capacity and Waste Acceptance Criteria (WAC) that are applicable to the entire facility. Current practice is to accept only materials that are below the WAC without any consideration being given to average WAC resulting from mixing. Without the consideration of mixing/ blending/averaging in calculating WAC, the OSDF is being underutilized and off-site shipment of material is greater than necessary. The RBES will change these practices to allow application of the OSDF WAC by averaging, which was the original intention and technical basis of the WAC.</p> <p>Additional changes in the application of the WAC would involve disposal of the Silos 1 & 2 debris in the OSDF and all other soils below WAC Resource Conservation and Recovery Act (RCRA) levels.</p> <p>b) OSDF leachate, at a rate of approximately 1 gallon/min (gpm), will be discharged to surface water bodies in the</p>	<p>Risk:</p> <p>a) The OSDF was engineered and constructed to accept waste material that meets the WAC based on cell average concentration. Implementing the RBES Vision will add about 30,000 cubic yards of impacted soil to OSDF and potentially increase risks levels associated with the OSDF from 1×10^{-7} to 1×10^{-5} risk levels will continue to be fully protective of human health and the environment.</p> <p>Under the current remediation approach, above WAC material is transported off-property as part of the Waste Pits Remedial Action Project. The transportation risks associated with the OU 1 selected remedy were evaluated in the OU 1 FS and were based on the off-site transportation of 628,200 cubic yards of material. Offsite transportation risks associated with the OU 1 selected remedy are as follows: 3.4 potential mechanical injuries to train crew members; 0.034 potential fatalities to train crew members; 0.030 potential mechanical injuries to other members of the public; and 0.0015 potential fatalities to other members of the public. A reduction in the off-site transportation of 30,000</p>	<p>The OU5 Record of Decision (ROD) Response to Comment (RTC) document includes the good faith commitment that the WAC will be a "not-to-exceed" limit. The WAC "not-to-exceed" commitment is not contained in the ROD itself. At a minimum, clarification with Stakeholders and Regulators will be required to implement the change. The approved WAC Attainment Plan also contains the agreement that only soil that is below WAC can be disposed of the in OSDF (i.e., the WAC is a "not-to-exceed" limit). Agreement with Regulators and an approved revision to the WAC Attainment Plan is required to implement the new approach.</p> <p>A revision to the WAC Attainment Plan needs to be negotiated to allow for the disposal of the Silos 1 & 2 debris and the below WAC RCRA Soil.</p> <p>The OSDF Post Closure Care and Inspection Plan requires the treatment of leachate prior to discharge. Requirements related to leachate treatment are being transferred to Groundwater/ Leak Detection and Leachate Monitoring Plan (G/LD&LMP) that will be revised later in CY2003. The G/LD&LMP will need to be revised</p>	<p>Department of Energy (DOE) at the Field Office or Headquarters level needs to determine if it is appropriate to pursue changing WAC application through negotiation at the Field Office or Headquarters level. Currently, it does not appear that there will be support for changing WAC application, working with Agency Representatives at the Site Level. This change represents a large cost savings and is a high priority with the Site Office.</p> <p>Action:</p> <p>a) A change in the application of WAC will require clarification of the commitment made in the OU5 ROD RTC document with Stakeholders and Regulators at a minimum. A change in the application of the WAC anytime prior to Closure would have a positive impact on the ability to achieve timely Closure. The earlier the change is negotiated, the greater the benefit to the FCP.</p> <p>b) DOE Ohio Field Office or Headquarters representatives need to discuss the proposed variance to leachate treatment with Stakeholders and Regulators. Decisions</p>

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	<p>former production area without further treatment, as long as all surface water Final Remediation Levels (FRLs) are met.</p>	<p>cubic yards of material would decrease OU 1 risks by 5%. Risks to on-site workers would not change under this scenario, since impacted material would still require excavation and transportation to the OSDF.</p> <p>The 1 gpm flow of leachate will not likely impact the overall ability of the surface water to meet FRLs. Implementing the RBES Vision will continue to be fully protective of human health and the environment.</p> <p>Scope:</p> <p>a) There would no longer be a requirement to reject all material that exceeds the WAC. Most of the above WAC (AWAC) soil currently requiring shipment off-property could be disposed of in the OSDF. Baseline estimates show approximately 30,000 cubic yards of AWAC soil remaining to be excavated.</p> <p>Cost:</p> <p>a) The remaining 30,000 cubic yards of AWAC soil is estimated to cost approximately \$12 million for excavation and off-site disposal. Disposal in the OSDF is estimated to cost approximately \$900,000, resulting in a net cost savings</p>	<p>to eliminate the requirement for treatment of all leachate, as long as all surface water FRLs are met.</p>	<p>regarding leachate treatment need to be in place by the end of FY04 to allow adequate time for planning and installation of a post-closure treatment system, if required.</p>

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		<p>of more than \$11 million. On-property disposal costs are approximately \$30 per cubic yard compared to off-property disposal costs at approximately \$400 per cubic yard.</p> <p>b) Surface water disposal of the leachate will eliminate the need for treatment in the Advanced Wastewater Treatment (AWWT) Facility or by passive treatment. The cost savings would occur in the post-closure period and do not result in a savings to current baseline remediation costs. However, the cost savings during the post-closure period is very significant.</p> <p>Schedule:</p> <p>b) Changing the approach to meeting WAC will eliminate some of the risk associated with meeting the 2006 Closure Date. The process for completing soil remediation will be significantly streamlined, but it is difficult to quantify the precise impact to the schedule.</p>		

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V-2	<p>Subsurface Soils/Sediments:</p> <p>a) The use of sediment FRLs at the FCP is undefined in the OU5 ROD. Current informal agreements with the Agencies have centered on the use of soil FRLs (82 ppm uranium) for streams and ponds. The RBES would apply the sediment FRLs (210 ppm uranium) to streams and ponds and other excavations targeted for future ponds and open water.</p> <p>b) Segregation of clean soil during deep excavation of foundations and subsequent use as fill will decrease the amount of soil sent to the OSDF. Applying the Cross Media Preliminary Remediation Goals (CPRGs) will reduce excavation of subsurface soil that has no surface exposure pathways.</p>	<p>Risk:</p> <p>a) The soil FRL takes into account the inhalation pathway and is therefore lower than the sediment FRL that assumes no inhalation pathway. The ponds and open water will have permanent water coverage resulting in no change in risk due to use of the sediment FRLs. Paddys Run does dry up in the late summer months, but controls (i.e., fences, signs, barriers) will be in place to keep people from utilizing the streambed in unallowable ways (e.g., motorcycles, ATVs).</p> <p>The use of the CPRGs will reduce soil excavation volume by 8,500 cubic yards and continue to be fully protective to the Recreational User of the site. Any soil that meets CPRGs will be buried, thus eliminating the exposure pathway to any soil that is above surface soil FRLs.</p> <p>Risks associated with excavating and hauling impacted soil to the OSDF were evaluated in the OU 5 FS. The selected remedy contemplated 1.835 million cubic yards of soil being disposed of in the OSDF. Risks associated with the excavation and disposal of</p>	<p>a) The OU5 ROD does discuss the use of sediment FRLs, but the exact areas of application are undefined. Informal discussions with the Agencies indicate their position that soil FRLs should be applied to streams and ponds. Agency agreement on the application of the sediment FRL would need to be secured.</p> <p>b) The approved Site-wide Excavation Plan (SEP) currently documents the agreement that all excavated soil is waste. An approved revision to the SEP will need to be secured to allow use of the CPRGs for subsurface soil.</p>	<p>Preliminary discussions have occurred between the DOE Site Office and the Ohio EPA on use of the sediment FRL. To date, there has been some resistance from Ohio EPA to the idea of using sediment FRLs in Paddys Run and site drainage channels. The primary concern is that individuals could access Paddys Run when it is dry and be exposed to concentrations at the sediment FRL that are higher because the inhalation pathway is not included. Controls on the FCP should prevent unauthorized use of Paddys Run and other drainage channels.</p> <p>Action: DOE at the Field Office or Headquarters level needs to meet with Regulators and Stakeholders and get concurrence on the proposed variance.</p> <p>a) There is no regulatory documentation that has to be changed to use the sediment FRL as the OU5 ROD discusses the use of Sediment FRLs.</p> <p>b) The use of CPRGs for subsurface soil will require a change in the OU5 ROD and an approved revision of the SEP.</p>

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		<p>impacted soil are as follows: 122 projected mechanical injuries; 0.58 potential fatalities for onsite workers. Leaving 8,500 cubic yards of impacted soil in place would reduce these risks by 0.46%.</p> <p>Scope:</p> <p>a) Approximately 4 miles of streams and drainage channels exist on the FCP that will remain in their current configuration after remediation. It is estimated that ponds and open water could cover an additional 60 acres of the site by the completion of remediation. It is estimated that the use of the sediment FRL could reduce the amount of soil requiring excavation and disposal by 8,500 cubic yards.</p> <p>Cost:</p> <p>a) The use of the sediment FRLs in Paddys Run and the Storm Sewer Outfall Ditch (SSOD) will result in savings of approximately \$255,000 in excavation and disposal costs in the OSDF, based on a reduction in 8,500 cubic yards, as discussed above.</p> <p>b) The cost impact of applying the CPRGs is more difficult to quantify. The use of the</p>		

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		<p>CPRGs will certainly eliminate the need to dispose of significant quantities of subsurface soil in the OSDF.</p> <p>Schedule: The use of the sediment FRLs and the CPRGs will reduce some of the risk associated with meeting the 2006 Closure date. The process of completing soil remediation will be streamlined as result of these changes in the FRL application.</p>		

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V-3	<p>Surface Water/ Groundwater: Current agreement requires pumping, treatment and re-injection of groundwater and treatment of storm water, remediation wastewater, and groundwater to meet uranium discharge limits to the Great Miami River.</p> <p>The RBES remedy would include full restoration of the aquifer to meet the uranium drinking water standard of 30 parts per billion (ppb), both on-site and off-site. The AWWT facility would be modified to retain 1800 gpm of the existing 2600 gpm capacity. This would allow early D&D of 90% of the existing AWWT footprint (soil and debris) and placement into the OSDF. This alternate treatment approach would not require formal changes to the OU 5 ROD or associated regulatory permits. Discharge limits would be accomplished primarily by adjusting groundwater pumping rates when necessary and terminating groundwater re-injection without significantly delaying the aquifer restoration time frame.</p>	<p>Risk: This alternative will eliminate the transportation risks associated with the off-site disposal of 70,000 cubic yards of soil and debris. The risk levels outlined below are based on rail transportation as evaluated in the OU 1 FS for the selected remedy. Off-site shipment by truck will result in higher risk levels. The risks associated with off-property shipment of 70,000 cubic yards of AWWT debris would include: the potential for 2.78 mechanical injuries to on-site workers during excavation and waste loading; .04 potential fatalities to on-site workers during excavation and waste loading; 0.38 mechanical injuries to transportation crew members; .0038 potential fatalities to transportation crew members; .0033 potential mechanical injuries to members of the public; and .00017 potential fatalities to members of the public. Under this scenario, the 70,000 cubic yards of AWWT debris would be hauled and disposed of in the OSDF.</p> <p>Risks associated with loading and hauling AWWT debris to the OSDF would include: the potential for 4.65 mechanical injuries to on-site workers; and the potential for .022 fatalities for on-site workers.</p>	<p>Stakeholder and regulatory concurrence must occur by April 30, 2004 in order for timely initiation and completion of the design, procurement and construction of an alternate treatment system.</p> <p>Although no formal ROD change is required, regulatory support relative to existing outfall criteria in the OU5 ROD, will likely be necessary to make this objective achievable. This support would specifically provide operational flexibilities during the initial stabilization phase of the replacement system.</p>	<p>DOE Ohio Field Office and DOE-HQ, through evaluation of the RBES documents and the Groundwater Strategy Report will need to achieve Stakeholder and Regulator acceptance of the RBES remedy not later than April 30, 2004. Continued discussions with Stakeholders and Regulators through the ongoing FCAB process is required in order to agree upon the RBES remedy in time to initiate detailed design, procurement and construction.</p>

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		<p>Scope: The current baseline groundwater remedy uses pump and treat technology with groundwater re-injection for the duration of the remedy, which is predicted to achieve cleanup levels in all impacted areas of the aquifer by 2023.</p> <p>The RBES remedy will include pump and treat and full restoration of the aquifer both on-site and off-site to meet the drinking water standard.</p> <p>Cost: The cost of the baseline remedy is estimated to be \$168 million. The RBES remedy cost has not been fully calculated to date. Installation of the replacement treatment system is assumed to be approximately \$5 million. This additional cost will be off-set by the ability to dispose of most of the AWWT and underlying impacted soil (up to 70,000 cubic yards) in the OSDF rather than the entire AWWT requiring off-site disposal after site closure.</p> <p>Schedule: Groundwater modeling predicts the current groundwater remedy would achieve the cleanup levels by 2023 in all impacted areas of the aquifer (on- and off-site). No significant change in the groundwater remediation schedule would occur under the RBES remedy.</p>		

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V-4	<p>Infrastructure: Current agreements require the removal of the new outfall line. All buildings, foundations and associated structures must also be removed under current agreements. RBES is to abandon the outfall lines, cofferdam, and other structures in place.</p>	<p>Risk: Leaving the new outfall line in place will eliminate the need to dispose of 5,000 cubic yards of soil and debris in the OSDF and will continue to be fully protective of human health and the environment. The new outfall line is plastic and can be cleaned and left in place without risk of future contamination.</p> <p>The use of D&D concrete debris as clean, hard fill will eliminate the need to dispose of approximately 12,000 cubic yards of material in the OSDF. All concrete debris will be certified clean. Use of the material as clean, hard fill will continue to be fully protective of human health and the environment.</p> <p>Institutional controls to ensure the new outfall line and D&D concrete debris are not excavated or removed will be required during LM.</p> <p>Based on the risk evaluation in the OU 5 FS, risks associated with the removal of the new outfall line and disposal of the identified D&D concrete debris in the OSDF would include: the potential for 0.67 mechanical injuries to on-site workers; and the potential for .0032 fatalities for on-site workers.</p>	<p>The OU3 ROD requires the removal of all man-made debris from the site. A clarification or potential change to the ROD will have to be negotiated to leave infrastructure after closure.</p> <p>Leaving the outfall lines in place and the associated Institutional Controls will be a significant issue.</p> <p>The grouting and abandonment plan for the monitoring wells would require compliance with OAC 3701-28-07 and 3745-9-10 governing private and public wells. In some cases, negotiation with individual landowners may be required for off-property wells.</p>	<p>The idea of leaving specific infrastructure (e.g., outfall lines, cofferdam) has not been discussed in detail with Agencies or Stakeholders. DOE at the Site Office level has issued conceptual public use plans for the FCP for public review and comment showing access roads and parking areas. Stakeholders and the Agencies generally supported some form of limited public access and use of the FCP. Discussions regarding monitoring and maintaining the OSDF requiring site access have been discussed in several public forums. The need for access roads and parking lots should not be controversial.</p> <p>Action: DOE Ohio Field Office or Headquarters representatives need to meet with Regulators and Stakeholders and get concurrence on the proposed variances. Once Regulator and Stakeholder concurrence is achieved, a clarification or change to the ROD will be required.</p>

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		<p>Scope: The old outfall line would be grouted and left in place and the new outfall line would be cleaned and left in place.</p> <p>Cost: Leaving the infrastructure listed above would eliminate the need to dispose of approximately 17,000 cubic yards of soil and debris in the OSDF. The total savings associated with this alternative would be approximately \$1,600,000.</p> <p>Schedule: Leaving the new outfall line in place will not have an impact on the baseline schedule since it will occur after the completion of aquifer restoration.</p> <p>Use of D&D concrete debris as clean, hard fill will accelerate the closure of the On-Site Disposal Facility by approximately 90 days and would significantly reduce the schedule risk associated with the March 2006 completion date.</p>		

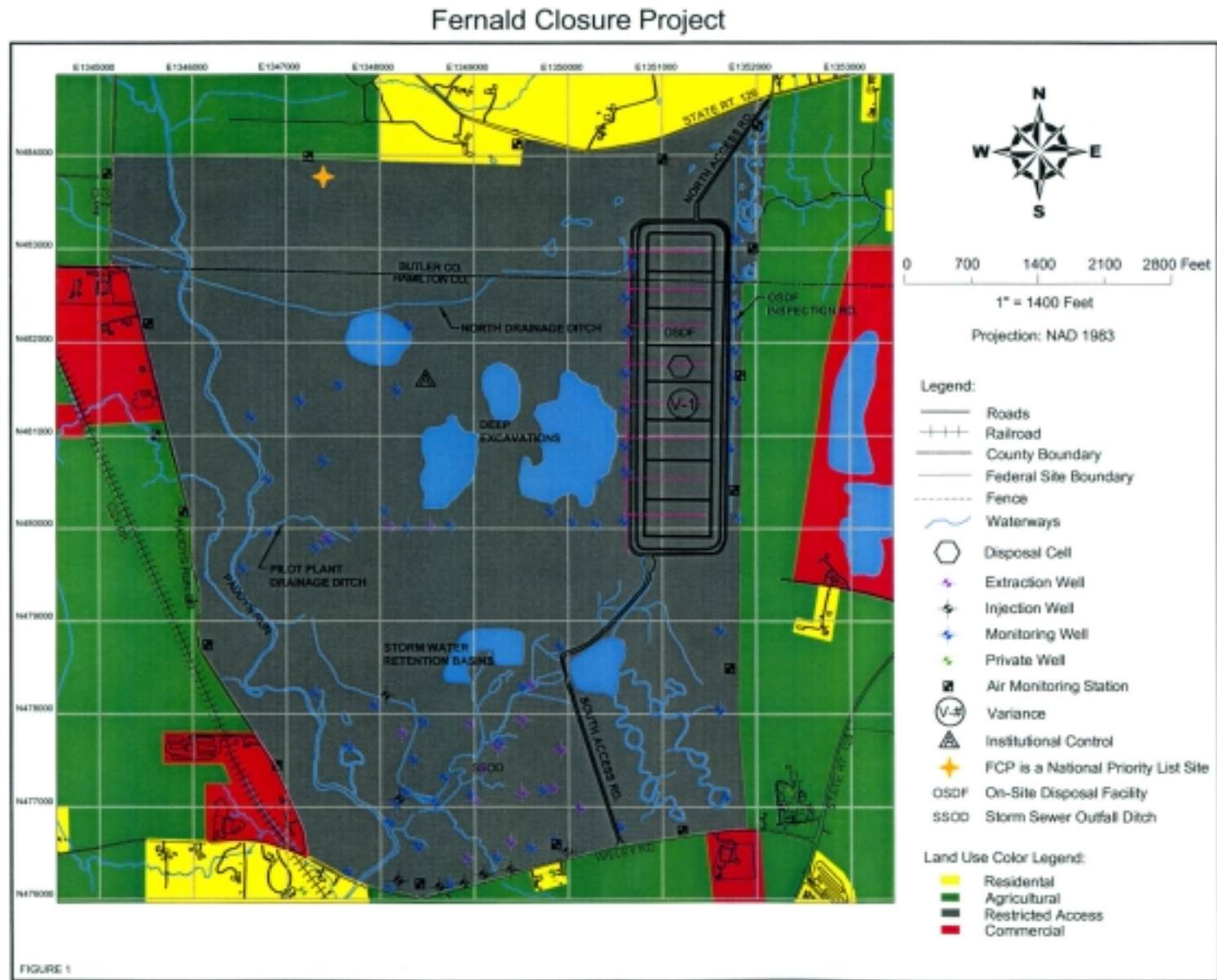


Figure 1. Site wide hazard map – current agreement end state.

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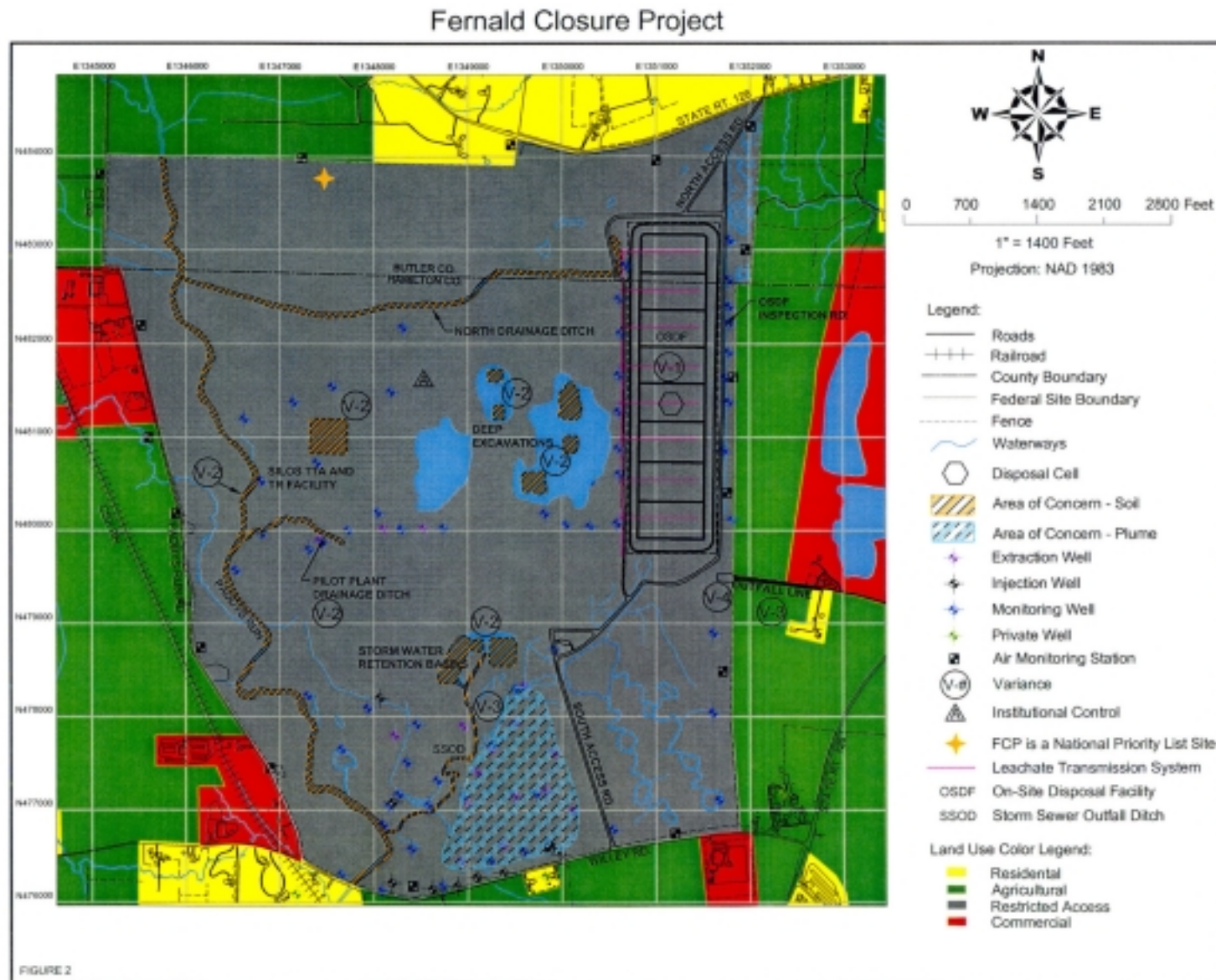


Figure 2. Site wide hazard map – RBES.